Internationalisation and its determinants: A hierarchical approach

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Abstract

This study builds a hierarchical model to examine how country-level institutional dimensions impact the individual-level factors on the internationalisation by early stage entrepreneurial firms. Drawing on multiple datasets, cross-level analysis is used to explicate the influence of a country's institution on the effects of the individual-level determinants on the internationalisation by early stage entrepreneurial firms, and this method enables the study of country-level specific effects. The results of the empirical research confirm the role of resource-based explanatory variables (i.e. innovative competence, business scale, technological commitment, and technological newness) in predicting internationalisation and also identify the positive moderating effects of institutions on this association.

Key words: *Resource-based theory; Internationalisation; Institutions; Global Entrepreneurship Monitor*

1.Introduction

The drivers behind firms going international have been a subject of increasing interest in international business research since 1970. (Rialp, Rialp, & Knight, 2005; Wagner, 2004). Over the past three decades, scholars have presented various descriptive models of internationalisation. Gemunden (1991) noted that there are over 700 explanatory variables that have been advanced in the literature as determinants of internationalisation. Buckley et al. (2007) investigated the effects of outward foreign direct investment and found that outward foreign direct investment is positively related to host market economy. However, relatively few studies of international entrepreneurship have empirically investigated the cross-level association between motivation factors and the decision of early-stage entrepreneurs to internationalise in particular. Ilan, Yeheskel, Lerner, and Zhang's (2013) research is an exception. From a resource-based perspective, Ilan et al. (2013) used the resource-based and internationalisation theories to explain the export behaviour of Chinese entrepreneurial firms, but their research was only at the firm level and neglected the national level factors. Moreover, understanding the impact of home contextual factors helps us to theorise about and empirically compare international entrepreneurship behaviours around the world (Hayton & Cacciotti, 2013). The extant literature suggests that national factors also help predict early internationalisation over and above individual- level factors, such as entrepreneurial orientation and market orientation (Liu, Li, & Xue, 2011), business group affiliation, international experience, and technological and marketing resources (Gaur, Kumar, & Singh, 2014). Thus, the impact of the home-country context on the internationalisation needs to be better understood and integrated into the existing theoretical and conceptual frameworks that explain the degree of internationalisation (Zander, McDougall-Covin, & Rose, 2015). Much less attention has been placed to the national institutions that could mobilise and enable resource-based factors to support internationalisation of entrepreneurial activities, and this neglect may have contributed to the inconsistent findings regarding the relationship between resource-based determinants and internationalisation.

In order to address the research gaps, this paper adopts a hierarchical approach to explain firms' internationalisation level from the resource-based view and national institutions based on Scott's (1995) well-established three institutional dimensions, namely, the regulative, normative and cultural-cognitive institutional dimensions. This paper responds to the call issued by Meyer, Estrin, Bhamik, and Peng (2009),Peng (2000), Peng (2003), Peng and Luo (2000) and Peng and Pinkham (2009) for more integration between institutional and resource-based views. It is therefore driven by two key questions: How do individual-level resource-based factors influence the internationalisation level of firms owned by those who are actively involved in starting a new business or who are managing a young business? To what extent does the national-level institution moderate the relation between resource-based factors and internationalisation?

2. Theoretical background

2.1 Resource-based view

To develop a more conceptually rigorous and parsimonious model of export behaviour, this paper draws on the resource-based view (RBV) of the firm (Barney 1991; Wernefelt, 1984). Early explanations of the drivers of international expansion are derived from the perspective that firms have specific intangible resources that form 'competitive' or'monopolistic' advantages (Barney 1991). The term "resource" is widely conceived of as "anything that can be thought of as a strength or a weakness" of the firm. The resource-based view argues that resources that are valuable, rare, imperfectly imitable and imperfectly substitutable (Barney, 1991) are an organisation's main source of sustainable competitive advantage from which sustained performance results (Conner, 1991; Peteraf, 1993). The resource-based view has in recent years become a major research paradigm that is guiding the inquiry into the antecedents of internationalisation (Hitt, Uhlenbruck, & Shimizu,2006; Tseng, Tansuhaj, Hallagan, & McCullough, 2007; Westhead,Wright, & Ucbasaran, 2001). For example, in order to further knowledge about the bases of internationalisation, Hitt et al. (2006) assessed the importance of two firm resources, namely, human capital and relational capital and confirmed their positive effects on internationalisation. Tseng et al. (2007) analysed how firm resources affect changes in internationalisation process by proposing a framework that consists of knowledge-based and property-based resources. They found resource determinants to be driving forces behind the internationalisation process. Despite the widespread use of the resource-based view in the area of international business, firm-specific resources as tool to explain the different degree of internationalisation remain unexplored (Zander et al., 2015). Following Penrose (1959), who defined a firm as "a collection of physical and human resources" and pointed to the heterogeneity of these resources, this study identifies three sets of resources that encompass the resource domain of a firm, namely, entrepreneurial resources, organisational resources, and technological resources.

Entrepreneurial resources refer to the characteristics of business owners, who are primarily responsible for the growth of the firm (Penrose 1959). The relationship between decision-maker characteristics and the degree of internationalisation has been much-researched.RBV provides a theoretical framework in which the variable can be anchored. Early research by Miesenböck (1988) argued that the key variable in business internationalisation is the decision-maker in a firm. According to Urbano, Alvarez, and Turró (2013), the central mechanisms of the decision-maker include entrepreneurial spirit and entrepreneurial innovative competence. Entrepreneurial spirit is considered to have a significant impact on organisations, because it can guide entrepreneurs' goal setting, opportunity discovery, opportunity exploitation, etc. (Bird, 1988). In addition, a principal mechanism through which an organisation develops new competitive advantage is through the pursuit of new initiatives – attempting to add new products to its current repertoire (Urbano et al., 2013). Vatne (1995) presented a model on the internationalisation of SMEs in manufacturing

activities, suggesting that an entrepreneur's spirit and competency may influence a firm's ability to identify and acquire external resources. Later, O'Farrell, Wood, and Zheng (1998) extended the model to incorporate the internationalisation of SMEs engaged in business service activities. They asserted that a variety of demand-side factors affect the reasons for foreign market entry, whereas supply-side factors can influence a business service firm's ability to internationalise.

Organisational resources, often proxied by business size and scale, are a measure of "managerial slack" indicated by the financial and physical resources at the disposal of the firm (Penrose 1959). Barney (1991) argued that business size and scale are indicators of the managerial and financial resources available in the firm, and to the extent that excess resources are available, a firm will look for opportunities for expansion. Bonaccorsi (1992) detected a positive relationship between large firm size and the intention of entrepreneurs to internationalise. This relationship is supported by numerous studies that focus on sales revenue size (O'Reilly, 1993; Westhead, 1995) or employment number (Westhead, 1995). Calofs (1994) found that while smaller firms certainly possess fewer resources than larger firms, they may nevertheless have appropriate resources to be involved in international activities.

Technological resources encompass the tangible and intangible technological assets of a firm. They are important factors in a firm's product mobility across national boundaries. Prior research has supported the positive effect of technological intensity on export motivation (Karagozoglu & Lindell, 2000) and performance (Gemunden,1991). In an examination of the internationalisation of 61 new ventures in the United States, Autio, Sapienza, and Almeida (2000) revealed that internationalisation is directly related to the use of product differentiation as a source of competitive advantage. Study from Knight and Cavusgil (2004) proposed that unique product and technology advantages contribute to the internationalisation of young firms. Zheng and Khavul (2005) argued that foreign firms can overcome the liability of foreignness by leveraging their "technological innovation capability", allowing firms to specialise their offerings to customers. Thus, companies with a strong technological innovative capability will internationalise more rapidly than firms lacking such capabilities and will obtain a product advantage in the broader international market (Leiblein & Reuer, 2004).

2.2 The moderating effect of national institutions

While resources and capabilities are certainly important (Peng,2003), recent work has suggested that strategies are moderated by the characteristics of the particular context in which firms operate (Meyer & Peng, 2005; Meyer et al., 2009; Peng, 2003; Peng & Luo, 2000). A number of scholars have suggested that export behaviour is not only driven by firm-specific resources as emphasised by traditional strategy research (Barney, 1991; Porter 1980), but is also a reflection of the formal and informal constraints of a particular institutional framework in which a firm is embedded

(Oliver, 1997; Scott, 1995). Dunning and Lundan (2008) argued that the internationalisation process of a firm is enabled or constrained by a multitude of institutional forces, including elements that both promote and hinder the upgrading of existing resources and capabilities. Buckley et al. (2007) asserted that consistent and liberal regulatory policies enacted by home country governments can encourage firms to engage in expansion aboard. On the other hand, a weak institutional framework leads to high transaction costs in establishing new business relationships and inhibits potential transactions (Meyer, 2001). Hayton and Cacciotti (2013) argued that understanding the impact of home contextual factors is helpful to theorise about and empirically compare international entrepreneurship behaviours around the world. Based on research on Asian organisations, Peng (2002) argued that in addition to the existing theories – mainly competition based on firms' resource and capabilities perspective (Barney, 1991),it is also necessary to adopt an institution-based view to collectively explain the differences in business strategies since "institutions govern societal transactions in the areas of politics (e.g., corruption,transparency), law (e.g., economic liberalization, regulatory regime), and society (e.g.,ethical norms, attitudes toward entrepreneurship)" (Peng,Wang, & Jiang, 2008, p. 922). Two broad branches of institutional theory exist, with one primarily deriving from political science and economics and the other being principally based on sociology and organisational theory (Ahlstrom & Bruton, 2002; DiMaggio & Powell,1991). The political science and economics branch contends that rules and procedures, and formal control are the drivers of human behaviours (North, 1990, 2005). North (1990) thus stated that institutions can be formal (constitutions, regulations, contracts, etc.) or informal (attitudes, values, norms, or rather the culture of a society). In contrast, the sociology and organisational theory branch argues that social norms, shared cultures, cognitive scripts, and schemas are the drivers of human behaviours (Ahlstrom & Bruton, 2002). Institutions are thus referred to as the less formally shared interaction sequences, and taken-for granted assumptions, which are derived from regulatory structures, societal norms, and cognitive scripts (DiMaggio & Powell, 1983, 1991). Scott (1995) integrates these two branches and formulates institutional forces into three categories, namely the regulative, normative and cultural- cognitive institutional dimensions. In this paper, it is argued that the explanatory power of firms' resources in regard to export propensity and intensity can be enhanced by the strength of the local institutional pillars. A country's institutional environment, which consists of regulations, social norms, and cultural-cognitive structures (Scott, 1995), sets the framework for transactions in the market by defining the "rules of the game" (North, 1990). The regulatory, normative and cognitive social system of a firm's institutional environment influences its institutional behaviour and decisions (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Scott, 1995).

The regulative dimension is defined as the process through which social actors (individuals and organisations) construct rule systems or conform to rules in pursuing their self-interests (Scott, 1995). It lays out the ground rules for doing business,

reflecting the laws and regulations of a region or a country and the extent to which these rules are effectively monitored and enforced. Coeurderoy and Murray (2008) looked at the effect of the institutional dimension, specifically the national regulatory environment, on the location choices and the speed of internationalisation by new technology based firms. They found a higher degree of internationalisation in the countries that offer better regulatory protection for intellectual property, and argued that the home country regulatory environment affects export decisions. Kiss and Danis (2008) asserted that the differences in regulatory regimes can determine the lack (or extent) of institutional support for international activities. Moreover, given that the resources and opportunities available to an entrepreneur must to some extent influence the likelihood of international expansion, a good national regulatory environment will increase the availability of requisite opportunities and resources in the country. In line with this view, it is argued that a good regulative environment will strengthen the effects of resources on an entrepreneur's propensity for internationalisation by anticipating fewer impediments and obstacles and enhancing the entrepreneur's perception of the ease of growing the venture.

Hypothesis 1. The regulative dimension moderates the relationship between firm-specific resources and the degree of internationalisation by early stage entrepreneurial firms in that the relationship is stronger when the regulative dimension is stronger.

The normative dimension an institution is defined as the element of an institution that encompasses the social norms, beliefs, values, and assumptions about human nature and human behaviour that are carried by individuals and socially shared (Scott, 1995). Recent works have identified that a gap exists between what some large groups of society believe to be legal and what they consider being legitimate (Webb, Tihanyi, Ireland, & Sirmon, 2009). The term "legal" refers to the rules defined by laws and regulations, while "legitimacy" refers to the rules specified by norms, values and beliefs. Normative rules are of importance because they introduce a prescriptive, evaluative, and obligatory dimension into social life when many laws are sufficiently controversial or ambiguous that do not provide clear prescriptions for conduct (Suchman & Edelman, 1997). The analysis by Manolova, Eunni, and Gyoshev (2008) found that, referring to formal laws and regulations, the absence of an effective market that protects property rights, fair competition and financial discipline was observed in developing countries. Therefore, ineffective formal regulatory institutions rely more on informal norms. Krueger, Reilly, and Carsrud (2000) found a positive relationship between the beliefs, attitudes and expectations of a social reference group with intentions to export, and argued that normative beliefs are key components in various models of the internationalisation by early entrepreneurial firms. Casson (2003) found that norms and values can increase the availability of requisite opportunities and resources, and thus affect the social desirability of international entrepreneurship as a career choice. Yamakawa, Peng, and Deeds, (2008) asserted that the normative dimension determines the extent to

which entrepreneurs value firms' resources, which is crucial in releasing the forces of resources for the development of internationalisation. Therefore, it posits that normative diemnsion can strengthen the link between frims' resources and the level of internationalisation.

Hypothesis 2. The normative dimension moderates the relationship between firm-specific resources and the degree of internationalisation by early stage entrepreneurial firms in that the relationship is stronger when the normative dimension is stronger.

Scott (1995) noted that the normative component reflects norms and values whereas the cultural-cognitive one describes the shared beliefs and perceptions in a society. The cultural-cognitive rules refer to the conception that constitutes the nature of social frames and reality by which individuals interpret information (Scott, 1995) and highlight the central role played by the socially constructed common framework of meaning. Social actors such as entrepreneurs are spurred on to export action not only in the light of the objective conditions (for example, rule of law) but also by their subjective interpretation of them. Recent findings have confirmed the variance in entrepreneurial cognitions across nations (Bosma & Levie, 2010; De Carolis & Saparito, 2006; Mitchell et al., 2002) and regions (Mai & Gan, 2007; Zahra et al., 2005). Bandura (2006) revealed that the local, regional, and national institutional environment is an important factor that influences international expansion. In particular, the environmental context affects internationalisation action through cognitive processes and the resulting behaviour of individuals. Bruton, Ahlstrom, and Obloj (2008) asserted that the institutional environment determines the process of gaining cognitive and moral legitimacy, and thus secure resources of firms. Ajzen (1991) contended that the cognitive self-regulation of entrepreneurs is an important aspect of human behaviour that can amplify and safeguard the central role of business resources. Therefore, it follows that institutions, combined with effective cultural-cognitive rules, will lead to higher levels of internationalisation.

Hypothesis 3. The cultural-cognitive dimension moderates the relationship between firm-specific resources and the degree of internationalisation by early stage entrepreneurial firms in that the relationship is stronger when the cultural-cognitive dimension is stronger.

3.Methods

3.1 Sample and design

The theoretical framework is tested using a multilevel design in which businesses (Level 1) are nested within countries (Level 2). The data come from three independent and publicly available sources. The firm-level data were collected from the Global Entrepreneurship Monitor (GEM) Adult Population Survey. The data for country-level variables were taken from the GEM National Expert Survey. The surveys were performed using a geographically stratified sampling procedure to locate

respondents and households aged between 18 and 64 for face-to-face interviews. The final sample consisted of 144,066 individuals from 56 countries. Since this study tries to explain the internationalisation of early-stage entrepreneurial firms, it relates to the total early-stage entrepreneurial activity (TEA) rate in which nascent entrepreneurs are the individuals engaged in setting up a business (first three months), and new business owners involved in operating businesses up to 3.5 years old (42 months). When business ventures reach more than 3.5 years old, they are labelled established businesses (Reynolds et al., 2005). This data was summarized in Table 1 and a flowchart regarding "TEA" assessment is provided in Fig. A1. Observations in the USA were dropped due to missing values for the normative dimension.

Table 1. Countries in the sample, adult-population prevalence of nascent and young entrepreneurs(unweighted)

Country	Obs	%nascent or young entreps	Country	Obs	%nascent or young entreps
Russia	3,541	4.29%	Turkey	2,401	11.78%
Egypt	2,501	7.64%	Pakistan	2,000	11.50%
South Africa	2,928	6.76%	Iran	3,178	11.70%
Greece	2,000	6.40%	Algeria	4,995	8.04%
Netherlands	3,501	9.05%	Tunisia	2,000	4.85%
Belgium	2,010	3.93%	Ghana	2,222	37.21%
France	4,003	3.89%	Nigeria	2,651	35.08%
Spain	2,187	5.11%	Ethiopia	3,005	12.97%
Hungary	2,001	9.09%	Zambia	2,157	41.67%
Italy	2,000	4.40%	Namibia	1,959	16.89%
Romania	2,004	8.09%	Botswana	2,003	27.95%
Switzerland	2,003	5.29%	Ireland	2,000	5.70%
United Kingdom	2,000	7.01%	Finland	2,038	5.93%
Norway	2,000	6.75%	Lithuania	2,003	6.68%
Poland	2,003	8.63%	Latvia	2,000	13.30%
Germany	4,300	5.95%	Estonia	2,004	12.07%
Peru	2,071	20.90%	Croatia	2,000	9.01%
Mexico	2,516	12.12%	Slovenia	2,010	5.02%
Argentina	2,018	16.45%	Bosnia and Herzegovina	2,001	7.99%
Brazil	10,000	16.20%	Macedonia	2,003	6.49%
Chile	2,420	18.18%	Slovakia	2,000	10.00%
Colombia	6,471	19.78%	El Salvador	2,180	14.49%
Malaysia	2,006	6.97%	Costa Rica	2,041	15.04%
Singapore	2,001	11.39%	Ecuador	2,004	26.59%
Thailand	3,000	18.16%	Uruguay	2,016	12.40%
Japan	2,010	3.98%	Taiwan	2,009	7.51%
Korea	2,000	6.70%	Palestine	2,000	10.40%
China	3,684	13.35%	Israel	2,007	6.27%
			Total	**144,066**	**11.80%**

Dependent variable

Ruzzier et al. (2007) suggested the use of multiple-item measures that reflect the structural and attitudinal aspects, and the performance of internationalisation to assess extent of internationalisation. Although multiple-item measures have been been found to be more reliable than single-item measures, Ramaswamy *et al*. (1996) cautioned that aggregating components might hide the effects of each individual component. This study thus used a single-item measure of the extent of internationalisation as defined by the percentage of sales in foreign countries to the total venture sales.

This paper utilized the publicly available Global Entrepreneurship Monitor (GEM) survey data set to operationalise the dependent variable. It identified the status of internationalisation of only nascent or new entrepreneurs and asked all identified nascent or young entrepreneurs – "What proportion of your customers will normally live outside your country? Is it more than 90%, more than 75%, more than 50%, more than 25%, more than 10%, or 10% or less or none?" The responses to this question were used to operationalise the extent of internationalisation. The GEM thus put these individual-level responses across seven categories. This study created a dependent variable to include five categories – (0 = No export; 1 = greater than 0 and less than 25; 2 = 25% and less than 50%; 3 = 50% and less than 75% and 4 = 75% and up to 100%). This operationalisation allows a more evenly distributed range of the percentage of internationalisation and it is therefore categorical in nature.

Independent variable

Entrepreneurial resources refer to the characteristics of business owners, who are primarily responsible for the growth of the firm (Penrose 1959). According to Urbano et al. (2013), the central mechanisms in entrepreneurial resources were measured by entrepreneurial spirit and entrepreneurial innovative competence. The existing theory on the conceptualisation of entrepreneurial spirit basically uses a typical model: Shapero's (1982) entrepreneurial event model. Following Shapero's model, entrepreneurial spirit was derived from perceptions of and the propensity to act on opportunities. The opportunity recognition process, as noted by Krueger et al. (2000), was an intentional process that is concerned with the entrepreneurial spirit of how well one intends to execute courses of actions required to deal with prospective situations. Prior researchers have argued that entrepreneurial opportunities exist primarily because different members of society have different beliefs about the relative value (the potential to transform them into a different state) of resources (Kirzner, 1997). Due to these different beliefs, not all opportunities are obvious to everyone all of the time (Hayek, 1945). In order for these ideas to be materialized into entrepreneurial resources, the entrepreneur has to possess the spirit to identify opportunities in the environment (Shane & Venkataraman, 2000) and it was measured by the question regarding if there will be good opportunities for starting a business in the area where you live in the next six months. Entrepreneurial innovative competence reflects the creation of heterogeneous outputs through the

firm that are superior to the market (Alon & Lerner ,2008) and attempts to add new products to its current repertoire (Urbano et al., 2013). This was measured by asking “Right now, are there many, few, or no other businesses offering the same products or services to your potential customers?” (1=many business competitors, 2=few business competitors, or 3= no business competitors).

Penrose (1959) pointed out that organisational resources are described as a measure of "managerial slack" and proxied by business size and scale. Similarly, Dhanaraj and Beamish (2003) argued that firm size is an indicator of a firm’s organisational resource base or slack. Following Penrose (1959) and Dhanaraj and Beamish (2003) , this paper used firm size to measure organisational resources. Organisational resources were thus measured based on an open-ended question from the GEM data: “Right now, how many people, not counting the owners but including exclusive subcontractors , are working for this business”.

Technological resources were measured based on two items developed by Li and Atuahen-Gima (2001), namely technological commitment and technological newness. Following Li and Atuahen-Gima (2001), a question related to technological commitment indicated the effort levels made by owner-managers to show potential customers their novel products and services, and a question related to technological newness indicated if the technological process is new or is being updated constantly. Therefore, values concerning commitment to technology were: about the technology in products or services, this assumes the value one “1” in the cases that customers consider this product or service new and unfamiliar while “0” in converse cases. In terms of the values of technological newness managed in generating the product or service offered by the company, it assumes the value of one (1) when the owner-manager mentions that the company uses technologies under five years of creation (new) and zero (0) to technologies created over five years ago (obsolete).

This study controlled for a variety of other factors. Considering the greater propensity of men towards internationalisation compared to women, it thus controlled for gender (male= 1, female =2) (De Carolis & Saparito, 2006). Since an individual’s age has been recognised as exercising an important influence on internationalisation activities (Arenius & Minniti, 2005), the study therefore included age variables to verify this relationship. In the theoretical literature, education was often treated as a proxy for human capital and an engine of ambition in regard to internationalisation (Bates, 1990). Educational measures are taken from the GEM Adult Population Survey. The respondents were asked to indicate the highest degree they had achieved. Their responses were harmonized into a four-category variable, namely “primary or below”, “secondary”, “post-secondary’’, and “graduate experience”. Such proxy measures have been successfully employed in teasing out the effects associated with different levels of education (Wößmann, 2003).

Country-level predictors

Consistent with Busenitz et al. (2000), the regulative pillar consists of regulations, laws, and government policies that offer support for business creation, reduce the risks associated with starting a new firm, and promote entrepreneurs' efforts to obtain resources. Therefore, this study measured the national regulative dimension based on three items developed by Busenitz et al. (2000), which capture coping with regulations, laws, and government policies.

Spencer and Gomez (2004) operationalised the normative construct with three variables from the GEM study that assess the participants' perceptions of their society's view on entrepreneurship as a career, the status and respect given to those engaged in entrepreneurship, and the visibility of entrepreneurship in the media. The same measurements were subsequently used by Stenholm, Acs and Wuebker (2013) and Urbano and Alvarez (2014). Hence, this study followed the same approach and used three variables to measure the normative dimension of country-level institutional arrangements: career choice, social status and media attention.

Prior research has used four variables from the GEM database to measure the cultural-cognitive dimension of institutional arrangements at the individual level: entrepreneurs' skills, knowing entrepreneurs, fear of failure (e.g. Urbano & Alvarez, 2014), and opportunity perception (e.g. Stenholm, Acs and Wuebker, 2013). In this paper, following the measures from Urbano and Alvarez (2014) and Steholm (2013), the cultural-cognitive dimension was measured by four variables from the GEM study: entrepreneurs' skills , knowing entrepreneurs, fear of failure, and opportunity perception.

Exploratory factor analysis (EFA) is further conducted to uncover the underlying factor structure and the distinctiveness of the latent variables. Table 2 details the results of our analysis using Varimax-rotation with Kaiser Normalisation. The rotated factor matrix generated a three-factor solution, with acceptable results (KMO=.860,p<0..001, cut off point 0.60). The reliability measures for the latent variables vary from excellent 0.915 (regulatory dimension) to acceptable 0.779 (normative dimension).

Table 2.Exploratory Factor Analysis, Validity, and Reliability

Construct	Measures	1	2	3	Source
Regulatory institutional arrangements AVE(%)=72.38 Cronbach's Alpha=0.915	Government policies (e g , public procurement) consistently favor new firms	0.681			GEM-NES
	The support for new and growing firms is a high priority for policy at the national government level	0.802			
	The support for new and growing firms is a high priority for policy at the local government level	0.746			
	New firms can get most of the required permits and licenses in about a week	0.840			
	The amount of taxes is NOT a burden for new and growing firms	0.859			
	Taxes and other government regulations are applied to new and growing firms in a predictable and consistent way	0.853			
	Coping with government bureaucracy, regulations, and licensing requirements it is not unduly difficult for new and growing firms	0.898			
Normative institutional arrangements AVE(%)=57.18 Cronbach's Alpha=0.779	Most people consider starting a new business a desirable career choice		0.701		GEM-APS
	Those successful at starting a new business have a high level of status and respect		0.609		
	You will often see stories in the public media about successful new businesses		0.659		
Cultural-cognitive institutional arrangements AVE(%)=71.32 Cronbach's Alpha=0.858	Do you know someone personally who started a business in the past 2 years?			0.792	GEM-APS
	Will there be good opportunities for starting a business in the area where you live?			0.886	
	Do you have the knowledge, skill and experience required to start a new business?			0.847	
% Explained variance		36.779	27.224	7.512	
% Accumulated variance		36.779	64.004	71.516	

KMO=0.798,Bartlett's p > .001. The cut-off point is 0.600.

AVE, average variance extracted; GEM-NES Global Entrepreneurship Monitor-National Expert Survey; GEM-APS Global Entrepreneurship Monitor-Adult Population Survey

3.2 Multilevel Ordinal Logistic model

Since this study combined individual-level observations with country-level measures, the data were analysed using hierarchical modeling methods. Given that there are a

discrete number of values for dependent variables and these values can be rank-ordered, the effects of covariates on the level of internationalisation were analyzed by multilevel ordinal logit model. In the hierarchical methods, fixed effects deal with individual factors that exert impacts on the dependent variable. To estimate the influence of country-level characteristics (level 2) on the individual's propensity for internationalisation, it also applied random effects that include unobserved country-specific intercepts and province-specific coefficients. This allows the intercept and coefficient of the individual-level predictors vary randomly across countries and it also enables more accurate tests of cross-level moderation effects (Martinet al., 2007).

The model specification is:

$$\mathrm{Y}_{ij} = \begin{cases} 1 & \text{if} \quad y_{ij}^{*} \le k_1 \\ 2 & \text{if} \quad k_1 < y_{ij}^{*} \le k_2 \\ 3 & \text{if} \quad k_2 < y_{ij}^{*} \le k_3 \\ 4 & \text{if} \quad k_3 < y_{ij}^{*} \le k_4 \\ 5 & \text{if} \quad k_4 < y_{ij}^{*} \end{cases}$$

Link function:

$$\mathrm{g}(\mathrm{y}_{ij}^{*}) = \frac{1}{1+e^{-(\mathrm{k_m}-\mathrm{y}_{ij}^{*})}} - \frac{1}{1+e^{-(\mathrm{k_{m-1}}-\mathrm{y}_{ij}^{*})}}$$

Generalised linear model:

$$\ln[\frac{\pi_{ij}}{1-\pi_{ij}}] = \beta_{0j} + \beta_{1j}\mathrm{OP}_{ij} + \beta_{2j}\mathrm{IC}_{ij} + \beta_{3j}\mathrm{BS}_{ij} + \beta_{4j}\mathrm{TC}_{ij} + \beta_{5j}\mathrm{TN}_{ij} + \sum_{k=22}^{K}\beta_k \mathrm{Individual\ Controls} + \mathrm{e}_{ij} \qquad (1)$$

$$\beta_{0j} = \beta_0 + \beta_6\mathrm{RP}_j + \beta_7\mathrm{NP}_j + \beta_8\mathrm{CP}_j + \sum_{n=9}^{N}\beta_k \,\text{Provincial level means} + \mathrm{u}_{0j} \qquad (2)$$

Integrating the link function and generalized linear model, it can obtain:

$$\mathrm{g}(\mathrm{y}_{ij}^{*}) = \frac{1}{1+e^{-(\mathrm{k_m}-\mathrm{y}_{ij}^{*})}} - \frac{1}{1+e^{-(\mathrm{k_{m-1}}-\mathrm{y}_{ij}^{*})}}$$

$$= \frac{1}{1+e^{-(\mathrm{k_m}-\beta_{0j}-\beta_{1j}\mathrm{X}_{ij1}-\cdots-\beta_{1j}\mathrm{X}_{ijk})}} - \frac{1}{1+e^{-(\mathrm{k_{m-1}}-\beta_{1j}\mathrm{X}_{ij1}-\cdots-\beta_{1j}\mathrm{X}_{ijk})}}$$

$$\frac{\partial(\mathrm{g}(\mathrm{y}_{ij}^{*}))}{\partial \mathrm{X}_1} = \frac{\beta_{1j}e^{-(\mathrm{k_m}-\beta_{0j}-\beta_{1j}\mathrm{X}_{ij1}-\cdots-\beta_{1j}\mathrm{X}_{ijk})}}{(1+e^{-(\mathrm{k_m}-\beta_{0j}-\beta_{1j}\mathrm{X}_{ij1}-\cdots-\beta_{1j}\mathrm{X}_{ijk})})^2} - \frac{\beta_{1j}e^{-(\mathrm{k_{m-1}}-\beta_{0j}-\beta_{1j}\mathrm{X}_{ij1}-\cdots-\beta_{1j}\mathrm{X}_{ijk})}}{(1+e^{-(\mathrm{k_{m-1}}-\beta_{0j}-\beta_{1j}\mathrm{X}_{ij1}-\cdots-\beta_{1j}\mathrm{X}_{ijk})})^2}$$

In generalized linear model, y_{ij}^{*} is unobserved dependent variable that represents the probability of respondent i in country j getting higher degree of internationalisation.β_{1j}, β_{2j}, etc. are the coefficients for major covariates (i.e. Entrepreneurial Spirit (ES); Innovative Competence (IC); Business Scale (BS); Technological Commitment (TC); and Technical Newness (HC) and control variables.Three measures of institutions are country-level covariates (i.e. Regulative

Pillar (RP); Normative Pillar (NP); Cultural-cognitive Pillar (CP)), and thus β_{6j} to β_{8j} are the coefficients for the cross-level interaction terms. u_{0j} is the national-specific effects (random effects) on the intercept. e_{ij} represents the residual from the level-1 equation (with group variance).

4. Results

Table 3 provided the means, standard deviations and pairwise correlation coefficients for the study variables. The correlations matrix in Table 3 showed some variables to be highly correlated. Thus, it further conducted a diagnostic test of multicollinearity by examining the variance inflation factors (VIFs) of all of the variables in the analyses, and it was found that multicollinearity is not likely to be a problem in this data set.

The hypotheses were tested using hierarchical analysis. A precondition for running a hierarchical model is that significant between-group variance exists for the dependent variable (Bliese, 2000; Hofmann et al., 2000). Therefore, an ANOVA was performed with individual-level internationalisation level as the dependent variable and country group membership as the predictor. This test implied significant between-group variance within the data, with $\chi^2(165)$ =5588.3(p < 0.000).The empirical results are presented in Table 4. Model 1 was an intercept-varying and a base model where the control variables of age, education, and gender were first entered. The intraclass correlation indicated that 26.3 percent of the total variance within the data resided between countries, which suggested that the country-level variance is both nontrivial and highly significant.

Table 3.Correlation matrix

	Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Internationalisation (1)	1.59	0.81	1.000										
Gender (2)	1.51	0.50	-0.068**	1.000									
Age (3)	38.31	12.01	0.016*	-0.033**	1								
Education (4)	2.96	1.58	0.146**	-0.026**	0.106**	1							
Opportunity perception (5)	0.23	0.66	0.026**	0.005	0.006*	0.018**	1						
Innovative competence (6)	1.51	0.64	0.057**	-0.012	-0.012	0.053**	0.001	1					
Business scale (7)	3.52	0.94	0.094**	-0.055**	-0.016	0.067**	-0.008	0.024*	1				
Newness of product (8)	1.41	0.69	0.137**	-0.014	0.033**	0.080**	0.001	0.103**	0.021	1			
Technological newness (9)	1.59	0.75	0.169**	-0.017*	-0.012	0.117**	0.017*	0.209**	0.034**	0.204**	1		
Regulative institution (10)	0.01	1.00	-0.243**	0.001	0.064**	-0.118**	-0.017**	-0.033**	-0.027**	-0.152**	-0.150**	1	
Normative institution (11)	0.01	1.01	0.096**	0.003	-0.181**	0.218**	-0.018	0.044**	0.046**	-0.001	0.066**	-0.125**	1
Cultural-cognitive institution (11)	0.01	1.02	0.080**	0.001	0.008**	0.048**	0.045**	-0.046**	-0.006	-0.036**	-0.100**	-0.047**	0.082**

Note: ** p<0.01;* p<0.05

In the next step (Model 2), a random coefficient model (intercept and slope as outcomes model) was applied, using level-1 variables as predictors. The analysis showed significant variance in both the intercepts and the slopes across provincial groups. The results also demonstrated that entrepreneurial resources (in terms of

innovative competence) and technological resources are positively and significantly related to the level of internationalisation. Additionally, organisational resources were found to have a significant positive relation with the probability of entrepreneurs choosing a higher internationalisation level. In particular, when business scale increases by one level, the odds ratio of choosing a higher internationalisation level increased by a factor of 1.028.

In Model 3 a set of interaction terms was entered to test the moderating effect of institutional arrangements on the level of internationalisation. A comparison of models 2 and 3 shows that the country-level variance reduces from 1.128 to 0.809, suggesting that the inclusion of the cross-level interaction terms explains additional country-level variance. Furthermore, some evidence was found to support the hypotheses that institutions can moderate the relationship between firms' resources and the level of internationalisation. For instance, regulative institutions are found to positively moderate the relationship between business scale and internationalisation degree ($p<0.001$), supporting the hypothesis that the stronger the institutional regulation dimension, the stronger the positive relation between firm-specific resources and the degree of internationalisation. Likewise, significant positive moderating effects are found from normative and cultural-cognitive institutional dimensions on the relationship between firm-specific resources and internationalisation level.

Looking at the control variables in all three models, it can be seen that age is consistently a significant factor in explaining the likelihood of choosing a higher internationalisation level. In addition, female entrepreneurs were found to be less likely to internationalise than male entrepreneurs. This is consistent with previous empirical findings (Reynolds et al., 2002).

Finally, this study conducted a cluster analysis to split the dataset into two country categories with weak, and strong institutional systems using three indices of institutions. It then performed separate regressions for weak, and strong entrepreneurial ecosystems. A cluster analysis was performed using the standard k-means method, with the quality of government index as the input variables, and the number of clusters equal to 2. It thus provided a data driven methodology for grouping the countries, instead of imposing ad-hoc cut off points to define the groups.The empirical results were shown in Table 5. Some interesting effects can be observed for both the individual- and country-level variables. First, from weak to high quality institutions, there were substantial increases in the effects of organisational resources and technological resources on the level of internationalisation. These patterns were consistent with the positive moderating effects of institutions on the association between entrepreneurial resources and internationalisation level. Second, entrepreneurial resources appeared to have a significant effect on the extent of internationalisation in strong institutions, whereas such an effect was not observed in a weak institutional environment. Third,

comparatively speaking, female entrepreneurs in countries with strong institutions were more likely to be inspired to internationalise than their counterparts in countries with weak institutions. Fourth, education was found to be a significant determinant of the degree of internationalisation across both institutional environments.

Table 4. Multilevel logistic regression analysis results

		Model 1		Model 2		Model 3	
		Coefficient	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**
Fixed effects							
Individual-level controls							
Gender		**-0.208*** **	**(0.032)**	-0.045	(0.055)	-0.036	(0.055)
Age		**0.003*** **	**(0.001)**	**0.004***	**(0.002)**	**0.005***	**(0.002)**
Education		**0.087*** **	**(0.011)**	**0.078*** **	**(0.018)**	**0.078*** **	**(0.018)**
Individual-level predictors							
Entrepreneurial resources	Entrepreneurial spirit			0.020	(0.041)	0.008	**(0.044)**
	Innovative competence			**0.033+**	**(0.043)**	**0.080+**	**(0.045)**
Organisational resources	Business scale			**0.029*** **	**(0.004)**	**0.039*** **	**(0.005)**
Technological resources	Technological commitment			**0.120** **	**(0.038)**	**0.134** **	**(0.042)**
	Technological newness			**0.306*** **	**(0.036)**	**0.283*** **	**(0.042)**
Regulatory institutional arrangements(RI)						**-0.658*** **	**(0.167)**
Normative institutional arrangements(NI)						**0.249+**	**(0.151)**
Cultural-cognitive institutional arrangements(CI)						**0.303+**	**(0.156)**
Cross-level interactions							
RI*Organisational resources	RI*Business scale					**0.015***	**(0.005)**
NI*Technological resources	NI*Innovative competence					**0.102***	**(0.041)**
CI*Organisational resources	CI*Business scale					**0.014** **	**(0.004)**
CI*Technological resources	CI*Technological newness					**0.095** **	**(0.036)**
Random effects and model fits							
Number of countries		56		56		56	
Country-level variance		1.176		1.128		0.809	
Log-likelihood		-16203.5		-6098.1		-6067.2	
Akaike Information Criterion		32421.1		12220.2		12194.3	

Note: *** p<0.001 ; ** p<0.01;* p<0.05; + p<0.1

Note: Only significant interaction terms are shown in this table

Table 5.Clustering analysis

Cluster	Country	Cluster	Country
1	Finland	1	Israel
1	Singapore	1	Lithuania
1	Netherlands	1	Russia
1	France	1	Italy
1	Switzerland	1	Greece
1	Turkey	1	Hungary
1	Macedonia	1	Croatia
1	Ireland	1	Japan
1	Taiwan	2	Ethiopia
1	Norway	2	Ghana
1	United Kingdom	2	Namibia
1	Estonia	2	Zambia
1	Korea	2	Nigeria
1	Uruguay	2	Tunisia
1	South Africa	2	Ecuador
1	Malaysia	2	Colombia
1	Germany	2	Algeria
1	Pakistan	2	Botswana
1	Iran	2	Chile
1	Poland	2	Peru
1	Latvia	2	Palestine
1	Spain	2	China
1	Slovakia	2	Thailand
1	Romania	2	Brazil
1	Slovenia	2	Costa Rica
1	Mexico	2	Egypt
1	Belgium	2	El Salvador
1	Bosnia and Herzegovina	2	Argentina

Table 6.Ordinal logistic regression in weak,,and strong institution regimes

		Weak institution regimes	Strong institution regimes
		Coefficients	Coefficients
Individual-level controls			
Gender		-0.041	**-0.027+**
Age		**0.009****	0.008
Education		**0.107*****	**0.038***
Individual-level predictors			
Entrepreneurial resources	Entrepreneurial spirit	0.016	**0.167***
	Innovative competence	-0.063	**0.124***
Organisational resources	Business scale	**0.025*****	**0.030*****
Technological resources	Technological commitment	**0.126****	**0.132***
	Technological newness	**0.207*****	**0.278*****

Note: *** p<0.001 ; ** p<0.01;* p<0.05; + p<0.1

5.Discussion and conclusions

Drawing on the resource-based view and institutional theory, this paper first confirms the impacts of entrepreneurial resources, organisational resources and technological resources on the level of internationalisation, and investigates whether three institutional dimensions at the national level can magnify the effects of firm resources on the level of internationalisation. The results of the empirical research identify a positive effect of resource-based explanatory variables on the degree of internationalisation and reveal the critical roles of national institutions in unleashing the forces of firms' resources in driving the development of the internationalisation level.

This study makes a number of contributions to the existing literature. First, the resource-based view has been criticised for its "little effort to establish appropriate contexts" (Priem & Butler, 2001, p. 32). In response to the recent calls issued by Meyer et al. (2009), Peng (2000), Peng (2003), Peng and Luo (2000) and Peng and Pinkham (2009) for more integration between the institutional and resource-based views, this paper develops a resource-based theory and an institutional theory to collectively explain the degree of internationalisation across early-stage entrepreneurial firms. Given that much less attention has been paid to national institutions that can mobilise and enable resource-based factors to support the internationalisation of entrepreneurial activities, and this neglect may have

contributed to the inconsistent findings in the existing literature. Therefore, the resource-based view can be complemented by introducing the concept of institutions to comprehensively examine the mechanisms of institutions that are required to release the potential of firms' specific resources. In addition, this study considers three dimensions of institutions allowing a much broader view of the resource-based factors –internationalisation relation. A substantial part of this paper focuses on investigating the extent to which national institutions moderate the relation between resource-based factors and the level of internationalisation. The findings complement the prior research that focuses on the central role of institutions in internationalisation (Meyer & Peng, 2005; Meyer et al., 2009; Peng, 2003; Peng & Luo, 2000; Sun, Peng, Lee, & Tan, 2014) and identified that different aspects of national institutions have divergent implications for the relationship between firms' resources and internationalisation. This adds a sense of complexity to the existing international research and brings new empirical insights regarding the impact of firms' resources on the propensity of entrepreneurs to export in countries with institutions of varying quality.

Policymakers have largely concentrated on institutions to increase entrepreneurial opportunities, but institutions may not be sufficient to stimulate international entrepreneurship (Stephan & Uhlaner, 2010). The findings of this study have implications in particular for policy-makers who are interested in encouraging early internationalisation by influencing institutional dimensions. It highlights the importance of national institutions in formulating policies and carrying them out in the process of reaping the benefits of firms' resources for the development of the internationalisation level. The observed moderating effect of the institutional system suggests that along with the motivational factors emphasised by the resource-based theory, it is important not to underestimate the role of the institutional system in shaping the propensity and intensity of export activity.

The findings of this study should be considered along with its limitations. While the measure of internationalisation captures internationalised sales, it is limited in offering much insight into the other activities that comprise internationalisation and how informal institutions would influence the extent of internationalisation. For example, future research might examine the extent of internationalisation in terms of foreign production, international sourcing, and geographical dispersion (Sanders & Carpenter, 1998). Moreover, this study is cross-sectional in nature. A longitudinal study is needed to fully capture the dynamic moderating effect of institutions. Specifically, different countries may require different institutional structures at different points in time (Holmberg, Rothstein, & Nasiritousi, 2009). The complexities of institutional arrangements across different stages of national development may vary significantly. This fundamentally important question could not be looked at in this study but deserves further investigation in the future.

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Appendix 1- Flowchart of "TEA" production